The Air Line Pilot

April, 1957

APR 11 1957

Modernization Of Aviation Facilities

A Special Report To The Air Safety Forum, Publicly Revealing For The First Time Some Of The Nation's Top Level Plans For Overhauling U. S.' Aviation Facilities

By James L. Anast

Systems Planning Advisor, Office Of Aviation Facilities Planning

This article covers some of the thoughts of the Systems Engineering Team of the Office of Aviation Facilities Planning.

The Systems Engineering Team first met late in June 1956. Its task, as defined by Mr. Curtis, was to help him carry out his responsibility to the President for developing a comprehensive plan for meeting in an effective and economical manner the nation's requirements for aviation facilities. The extent and characteristic of the traffic are the subject of concurrent study by another group, which has supplied the Systems Engineering Team with interim reports on its findings and forecasts. The task of formulating legislative, organizational, administrative and budgetary recommendations to implement the plan is assigned to a third group.

Objectives Of Study

The Team, in its first discussion with Mr. Curtis, arrived at three objectives for its study:

- To become acquainted with the problems of air traffic control and with the past and present efforts to solve these problems.
- To develop a master plan for an air traffic control system capable of continuing growth to meet the needs of the next twenty years, as determined in the concurrent study on requirements.
- To define the research and development effort necessary to develop the facilities under the plan, and to discuss the organizational mechanism appropriate to this effort.

Cooperation Offered

The Team has had a most unusual opportunity to become acquainted with the field it set out to study. We have been made welcome in airport control towers, air traffic control centers, and in the cockpits of civil and military aircraft, and have had many frank discussions of the present system. Representative groups from all users and development agencies have given us thoughtful comments on the current problems and considered views as to the directions in which aviation facilities should develop.

We have made visits to the laboratories engaged in developing equipment pertaining to aviation facilities.

The Civil Aeronautics Administration, in addition to furnishing us information, arranged for a two-day indoctrination course at its Training Center at Oklahoma City.

We have reviewed the written reports: SWG-5, SWG-13, for example. We have been helped considerably by informal discussions with a number of individuals who have thought long and effectively about air navigation and air traffic. I would mention Capt. Saint and Vernon Weihe, for example.

The Air Line Pilots Association has given us significant help by forming a representative group, with which we have had discussions on the problems of traffic control, and on preliminary ideas on a recommended program for the next twenty years.

I cite the various sources which have aided us, in part to acknowledge their generous contributions, and in part to indicate that our study of the problem has not been done in isolation.

1975 Needs

Our directive impelled us to examine the extent and character of the traffic forecasted for 1975, and gauge whether the technology available today and expected in the future would be adequate. Our analysis, fortunately, indicates that the aerial traffic for the next two decades could be handled without intolerable cost, inconvenience, or delay to the user. We are confident, in short, that we are dealing with a problem that is soluble.

In the course of our analysis we examined several basic concepts of air traffic management. For example, one could imagine that a system could be evolved which did not contain a central ground organization for safe operation. If electronically one could provide "vision" to each individual pilot, giving him precise information on the position, speed and heading of other neighboring traffic, there appeared to be sufficient space to permit safe operation of even the highest speed aircraft, under all weather conditions. We could not see, around the corner, however any such instrumentation.

Another concept examined, was a system allowing relatively unrestricted freedom of operations. In this case, a ground surveillance of the air situation would be maintained to predict conflicts and intervene only occasionally to prevent such conflicts. We do not know, however, of equipment which might be

Vol. 26, No. 4

The Air Line Pilot

April, 1957

Ed Modes, Editor
Helmut Lorsch, Asst. Editor

Entered as Second Class Matter at the Post Office at Chicago, Ill. Copyright 1957, by Air Line Pilots Association, International.

Clarence N. Sayen
President
Grant M. LeRoux
First Vice-President
Kay McMurray
Executive Vice-President
R. L. Tuxbury
Secretary
D. J. Smith
Treasurer

REGIONAL VICE PRESIDENTS

C. C. Spencer, Jr. ..... Region I
R. J. Rohan ..... Region II
C. E. Luther ..... Region III
N. G. Carper, Jr. ..... Region IV
W. H. Drummond ..... Region V

Larry Cates
Legislative Representative

Published Monthly by the Air Line Pilots Association, International, Affiliated with A. F of L.-C.I.O. Publication offices: 55th Street and Cicero Avenue, Chicago, 38, Illinois.

Advertising appearing in this magazine cannot be construed as being an endorsement by the Air Line Pilots Association or The Air Line Pilot.

Opinions expressed by individual authors in The Air Line Pilot do not necessarily represent official ALPA opinion, unless specifically so stated, and therefore should not be construed as such.

Annual Subscription, $2.50

66

able to cope with conflicts which would appear in random numbers and at random times and places.

We concluded that in the present ways of managing air traffic were concepts which should and could be retained as the foundation for the modernization of the system. This is not to say that they cannot be improved. Special Working Group 13 of the Air Coordinating Committee, for example, has been working for two years on a fundamental modification to the present concept — the division of air traffic into two separate modes. In one mode, conflicts are prevented by the air traffic control system without regard to the visibility conditions; in the second mode, conflicts are prevented by "see and be seen" action of individual pilots.

Available Airspace

While we do not believe that ways to implement these concepts can be determined around the conference table, we believe that further analysis and actual experimentation will show that there is airspace, and there will be techniques to permit safe and expeditious flow of air traffic — with these two modes physically separated from each other.

To illustrate this, the routine traffic between Washington and New York is about 20 movements per hour. Using one-way airways and some segregation by speed class, one could expect that an airway could handle at least three movements per hour. Four airways using only two altitudes would be sufficient to handle this traffic. Our calculations, based on preliminary forecasts by our Requirements Group, indicate that the total traffic, under the most favorable visibility conditions, in the 1975 period, between Washington and New York may have peaks as high as 150 per hour. Expecting that speed segregation and a good surveillance system will permit an average 15-minute separation between aircraft, six airways using six altitudes will be sufficient. There appears to be space for "see and be seen" altitudes or lanes, and even a third mode involving positive separation at altitudes or lanes for operators who can navigate and communicate but not necessarily fly under bona fide IFR conditions.

The development of regulations, procedures, and for that matter the development of instruments and equipment to permit such a segregated operation cannot be carried to completion by the Systems Engineering Team. We believe that experimentation by teams of operationally experienced and engineering personnel, supported by adequate equipment development effort, will result in equitable and practical solutions.

We believe the proper goal for such experimentation is to permit a user to take off, fly and land optionally under positive separation or by "see and be seen" rules. We also think that traffic control under all weather conditions should cover initially those altitudes involved enroute in transcontinental operation, and like the high density operation conducted in Washington last year, a similar test could be made, setting aside one or more altitudes — say between Chicago and New York — for testing of positive separation. If this separation is to be done successfully, simple, reliable procedures and instruments must be utilized to provide information to pilots on location of the boundaries of positive and "see and be seen" zones, and augmented by a surveillance system as a backup, particularly in terminal areas.

Other Basic ATC Concepts

I should mention several other basic concepts which we believe to be fundamental to air traffic control: the use of fixed sections of airspace as the basis of airspace reservation, and the continued use of human traffic controllers as the basic decision-making element in the system. This is not to say that automatic computing machinery will not be used. On the contrary, one of the most significant improvements which can be made to the system is the mechanization of a large share of the controllers and pilots workload in computation, coordination and communication.

Modernization Needed

While citing the present concepts, in their present state of evolution, as a logical foundation for further growth, there are many elements of the system which can and should be modernized.

For example, where a fixed airway structure is used today for transcontinental flight, we call for a flexible airway system to take advantage of favorable meteorological conditions and to avoid adverse ones.

Where complex routings are necessary today, we call for a revamped airways structure of one-way, speed segregated airways, and even slant airways if they are feasible, especially in multi-airport terminal areas.

Where communication is accomplished between pilot and controller — and between controllers by voice, we call for the utilization of a flexible air traffic control signalling link, and a data link between controllers.

Where human controllers today are forced to carry out all the bookkeeping, computing, coordinating and decision-making functions of air traffic control, we call for comprehensive machine assistance in all of their functions.

Where flow control is instituted and maintained with inadequate information of the condition of the system, we call for continuous machine collation of traffic expected throughout the system to permit efficient determination by operators and controllers of action pertaining to flow control.

Although we do not believe that air defense and air traffic control should be pushed into functional integration, we believe that efficient mechanized transfer of data between the two systems will result in a mutual advantage.

Where air defense fighters today cannot climb out and attack potential enemy targets directly, we call for precisely defined 3-dimensional climb paths, whose occupancy is coordinated with air traffic control.

I have covered, I believe, some of the points of interest to you of our ideas regarding the characteristics of the system of the next two decades. Our most important recommendation to Mr. Curtis, however, pertains to the actual process of improving the system.

Just how a sustained effort for modernization of the nation's aviation facilities should be organized administratively is a question which seems to us to lie outside our task. We have the opinion that, however it is contrived, it must have certain essential characteristics if it is to be effective, and we have felt free to set forth our ideas on these matters.

Elements Listed

Three main elements in the process of modernization are,

- Deciding what the requirements will be;
- Developing improvements, and
- Timely introduction of those improvements.

In the United States today, we know how to harness governmental, industrial, and institutional effort to create systems of great scope and complexity. These methods have developed rapidly under the stimulus of a potential enemy threat to the nation. But, a prerequisite to successful and timely development is the definition of the requirements, and we recommend the establishment of a unified government mechanism to accomplish this. We believe that this mechanism should operate directly under government authority which sets forth national aviation policy.

Where this is done today by part-time committees and boards, we rec-

(Continued on Page 21)

Air Traffic Control Development Panel.

Pilot Traini equirem

Special Report

Fifth ALPA Air Safety Forum

Critical Problems Relating To Aviation's Most Decisive Period Are Covered At Three Day Meeting Attended By 222 Persons From Entire Industry

The Fifth Annual ALPA Air Safety Forum was held at the Hotel Shoreland, Chicago, March 5, 6, and 7. It was the largest of the five Safety Forums held since 1953. In contrast to the first Forum, which was attended by only a little over 50 persons, 222 delegates, guests and observers, representing air line pilots, air carriers, government, aircraft manufacturers and the military, attended the 1957 Forum.

Coming at a time when aviation is facing some of its most critical decisions and entering a period when the need for long-range planning and cohesive development is urgent, the agenda for the three-day meeting covered the timely topics of Turbine Transport development, Air Traffic Control developments, and Pilot Training Requirements for present and future aircraft. In addition, individual papers and reports were delivered on technical and research developments, including crash injury research, human engineering in aircraft design, and emergency evacuation procedures.

Opening Day

The Forum got underway on March 5 with ALPA Secretary, R. L. Tuxbury (UAL) serving as master of ceremonies.

The first portion of the Forum, the morning sessions, were closed meetings devoted to an ALPA Safety Organization panel. T. G. Linnert, C. F. Eck, and T. A. Basnight, of the ALPA Engineering and Air Safety Department, outlined ALPA's Air Safety functions.

ALPA Safety Activities

Linnert said there currently are nine ALPA committees studying the new transports, either in design stages, or in the prototype flying stage.

Linnert

Studies by these committees, he pointed out, have resulted in: (1) recommendations direct to the manufacturer; (2) recommendations requiring promulgation of new Civil Air Regulations; (3) recommendations falling into the category of "customer option."

He said that as the result of last year's Annual Airworthiness Requirements Review, the CAB and industry has considered 14 ALPA-proposed airworthiness regulations for adoption as transport design requirements.

ALPA accident representation and investigation has been improving steadily, he said.

A continued efficient incident reporting program is still a basic requirement of an air safety program, it was pointed out by Eck.

"In order to know that a problem exists," he said, "we must have an incident or a group of incidents on which to focus our attention and show a demonstrated need. For that reason, all of us in ALPA's Air Safety Organization, including our Regional, Area, Central, and Council Safety Chairmmen need the cooperation of each air line pilot in order to increase the effectiveness of our air safety program. There is a necessity for the individual air line pilot to ferret out and report

Training Requirements Panel.

Turbine Transport Airplane Development Panel.

potentially dangerous operating conditions of which he becomes aware."

"In this respect," he emphasized, "the CAB near-miss reporting program, however valuable, will not take the place of direct reporting by each pilot to his Safety Chairman of any incident which is considered to be so dangerous that an immediate investigation and correction is a necessity."

Basnight said, "the air line pilot has the best opportunity of any user of such vital safety items as air traffic control service, instrument approach and visual landing aids, as well as airports proper, to evaluate the efficiency of such aids and services.

Basnight

"It is the air line pilots' responsibility," he said "to keep the providers of those services, namely, CAA, CAB, and the various airport managements, completely apprised of our requirements, of our problems and, for more important, of our recommended solutions."

Capt. Dave Halperin, TWA Central Air Safety Chairman, reported on the Central Air Safety Chairman's Procedure. Regional safety activities were covered by Capt. Harold Miller (AAL), Ft. Worth Regional Safety Chairman. TWA's Chairman of their 1649 Committee, Capt. Bob Adickes, covered ALPA's New Airplane Evaluation Activities.

ALPA Air Safety Organization Panel.

Forum delegates during visit to UAL Flight Simulator Installation.

Forum Officially Opened

The Forum opened to the industry during the afternoon session of March 5, with a welcoming address by ALPA President Sayen.

Sayen cited the air line pilots' contribution to air safety. He noted that the occasion of an Air Safety Forum enables pilots to meet with representatives from other factions of the industry, and vice versa, to discuss mutual problems and learn what solutions are needed to solve these.

Sayen

"While many other Forums are held throughout the industry each year, all of which contribute to the overall good of aviation and air safety," he pointed out, "the ALPA Forum is the only one concentrating on the operational viewpoint—the problems and possible solutions as they look to the man up front in the cockpit flying the airways day in and day out under all conditions."

Sayen pointed to this year's agenda as an indication of the pilots' awareness to the most urgent problems facing them. Air Traffic Control, Turbine Development and Pilot Training are uppermost on pilots' minds as aviation prepares to enter the jet transport age, he said.

Technical Papers

The following presentations were made during this session: "Problems in Promoting Air Safety," Jerome Lederer, Managing Director, Flight Safety Foundation; "The Pilot-Design Engineer Relationship," William Stieglitz, Design Safety Engineer, Republic Aviation; "Crash Safety Design of Flight Crew Stations," Howard Hasbrook, Dir., Aviation Crash Injury Research, Cornell University; "Training Pays Off," Capt. A. E. Harned, U. S. Coast Guard; "Emergency Landing of PAA Stratocruiser in Pacific," Capt. Richard Ogg, PAA. The evening was devoted to a demonstration of UAL's Flight Simulator Installation. Some highlight excerpts from the agenda:

Jerome Lederer, *on The Promotion of Air Safety:* "The predominant pattern of fatal and non-fatal accidents varies from year to year, but approach and landing, and turbulence are very prominent. Fire following crash continues its terrible toll. Mid-air collisions, though happily infrequent, is the most ominous. The technical knowledge to reduce to a large degree the incidence of landing accidents, turbulence, fire following crash, mid-air collisions is here or on the horizons. This also applies to the new problems coming up, such as explosive decompression.

"We are approaching a critical time in the history of air safety because of human frailties. It may be that new problems will appear more rapidly than solutions to old ones, but technical information is rapidly becoming available to solve our current problems. Emotional conflicts, politics, litigation, complacency that delay safety measures are the penalties we pay for the privilege of living in a democracy. In a dictatorship heads would be knocked together. Objectives would be attained sooner but at the sacrifice of personal rights that are more important than safety. Each segment of aviation believes that its principles of conduct should prevail. There comes a time in every man's life when he must give up his principles and do what he thinks is right. We've got to show that we can attain our ends by getting together as reasonable men ready to surrender some freedom of action for the common good. If we do not do this ourselves, it will be done for us by the march of events: accidents."

Howard Hasbrook, *on Crash Safety Design:* "In some accidents, the cockpits were relatively survivable but death occurred because agreement was never reached in the early days on what kind (and how much) crash protection should be incorporated in cockpit design. Part of this problem lies in our complacency about our involvement in accidents. One of the greatest deterrents to getting—and using—crash-safety design and equipment in aircraft cockpits and automobiles has been the erroneous impression that high speed is necessary to cause death or serious injury in an accident . . . Vital areas of the body—the torso and head in particular—must be prevented from striking, or being struck by, rigid structure or objects which can impose heavy blows on small areas of the body or head. Rigid knobs, boltheads, window frames, latches, fire extinguishers, and other such items must not be permitted to contact the human body in accidents in which the aircraft structure is not demolished."

Hasbrook

Richard Ogg, *on Emergency Procedures:* "In handling passengers under emergency stress, the importance of crew calmness and deliberateness is very great. When crew members, and especially the captain, convey the idea of: 'We aren't scared, we know what we are doing, and we are going to do it right,' then passengers will assimilate the same collected feeling."

Ogg

Second Day

The second day of the Forum, March 6, was devoted to panels and discussions on Air Traffic Control Developments and Turbine Transport Development.

Air Traffic Control

J. D. Smith (CAP) was chairman of the Air Traffic Control Panel and also presented a paper on "The Airport's Effect on Air Traffic Control." Others making up this panel and their topics were: "Air Traffic Control System Concept Proposal to Meet Pilot Requirements," Capt. Sam Saint (AAL), ALPA ATC Committee; "CAA's Plans for Air Traffic Control Improvements," Henry S. Chandler, Deputy Director, Office of ATC, CAA; "The Air Carrier's Views on Adequate ATC," General Milton Arnold, V. P., Operations and Engineer-

Forum M. C.

Capt. R. L. Tuxbury

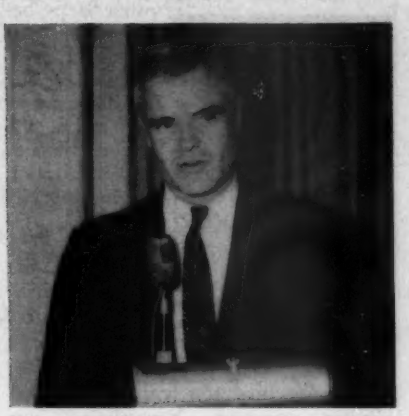
ing, Air Transport Association; "Aviation Facilities Planning for the Nation's Future," James Anast, Systems Planning Advisor on the Curtis Committee; "The Computer in the Air Traffic Control Problem," Dan Ross, Development Engineer, Int'l. Business Machines; "Military Requirements for ATC," Col. J. F. Taylor, MATS. Some excerpts from the discussions:

Smith

Capt. J. D. Smith, *on Airports and Traffic Control:* "At long last, it is now possible to conclude that all segments of aviation wholeheartedly agree that traffic control is one of the most serious problems facing the industry. It is quite simple to conclude that the inadequate traffic control problem is fully recognized and strenuous efforts by the responsible agencies will, in the not too distant future, bring about improved utilization of the airspace in a manner consistent with safety. . . . The primary factor which will determine the degree of efficient use of airspace consistent with Safety is the airport. Therefore, it is quite imperative that immediate attention be directed to raising airport efficiency so as to be capable of continually maintaining at least the same capacity of the traffic control system. To date, no one in this country has developed an airport system that will properly handle the volume of traffic which the future traffic-control system will accommodate. It therefore becomes quite imperative that emphasis be directed to insuring that the airport and traffic control system can operate together at least to the capacity of the traffic-control system. The inadequate airport capacity problem is every bit as serious as an antiquated traffic control system. Improvement to one without bettering the other will bring only token relief. We have a crying need for: (1) proper approach lighting with condenser discharge flashing in sequence; (2) adequate runway threshold lighting and marking; (3) sufficient runup areas so as to be able to bypass other aircraft; (4) runway flush lighting; (5) more straight-in instrument approach procedures at lowest approved minimums; (6) improved airport parking areas; (7) properly spaced parallel runways; (8) adequate taxiways; (9)

Safety Forum Banquet Speakers

CAB's James Durfee


CAA's James Pyle

CAA's Oscar Bakke

MAT's Col. J. F. Taylor

M.C. Robert A. Adickes

1st V.P. Grant M. LeRoux

high speed turnoffs, just to mention a few."

Henry S. Chandler, *on One-Way Airways:* "In addition to the many other steps being taken toward improvement of the Air Traffic Control System is the designation and implementation of one-way airways. At present, we have a project in the mill on which some positive action already has been taken. As a first step, we propose to do what we can in this direction with our existing airways structure. Nevertheless, our studies on this subject will consider the need for major modification, if such action is indicated. We believe that one-way airways are essential to the safe acceleration of Air Traffic movements. We believe that they will materially improve the Air Traffic Control situation by simplifying the controller's problem, and, more important, eliminate much of the collision potential which now exists."

Chandler

General Milton Arnold, *on The Need For A Common System:* "Any broad concepts and procedures of traffic control as well as most of our communication facilities, electronic and visual aids must be generally acceptable to the three users of the air space; airlines, military and general aviation. The three big divisions of flyers are constantly using the same air space, consequently it is basic to believe that the system, or systems, must meet the needs of all. Not necessarily to the same degree under all conditions and at each location, but certainly the systems of today and of tomorrow must incorporate these varying demands. The air line pilots as well as the airlines have pioneered this philosophy of a common system. Any new system in the future must be gradually integrated into the system we know today."

Arnold

James L. Anast, *on Modernization of the Nation's Aviation Facilities:* "The modernization effort we recommend will take some time to initiate and some further time to produce visible results. Will those results come too late to avert a serious crisis in aviation traffic? We think not. Since we started our study last June, significant steps have been taken, with apparent success, to improve today's air traffic control system, essentially by putting to active use in critical areas certain techniques and improvements that have been at hand for several years. We have noticed, in our review of today's system, several other short-term possibilities for improvement that seem to us to be needed to augment the current CAA program, and have already recommended these to the appropriate people. Secondly, we have rather definite views as to how the modernization effort should proceed, at least at the outset. It should work, we believe, toward putting into early use for the management of aviation traffic, some of the technical developments that are already available, or nearly so. We, therefore, recommend a three-part national program to start immediately: the first to augment the current CAA implementation program; the second to exploit existing technology; and the third to establish a continuing capability for modernization of the system." *(Editor's Note: Complete article begins on page 2 of this issue.)*

Anast

Dan Ross, *on The Use of Computer Systems in Air Traffic Control:* "The basic problem in overhauling the ATC system is not the lack of engineering capability, either in government or in industry. Nor does it lie in the lack of stated requirements from operational groups. The obvious difficulty has been the failure of the several airspace users to compromise on a set of system requirements possessing the essential ingredient of consistency. Thus, the engineering groups have been forced to waste a significant fraction of their effort in trying to predict what the upshot of the operational and political uproar was to be before they could even start on the task of preparing an engineering plan on an overall systems design basis."

Ross

Col. J. F. Taylor, *on The Military's Requirements for ATC:* "Basically, our requirements are the same as the air line pilots—to be able to operate our air vehicles with as few restrictions as possible permitting full utilization of their design capabilities under all weather conditions and with safety. The system must be ready instantly to support effective military operations should an emergency arise. Air Traffic Control services of the past and as yet in being have been unable to satisfy these present-day needs. But some events of the past year have been extremely encouraging, for there is a growing appreciation among the public, industry and government of the critical nature of our air traffic control problems. The developments and pronouncements of those who are actively engaged in overcoming the various aspects of these difficulties has given rise to a general feeling that, at long last, those who should be concerned really are interested. What's more important, it appears that we know which way to go."

Taylor

Aircraft Development

Homer Mouden, Braniff, was the Chairman of the Turbine Transport Airplane Development Panel. Covered by the Panel were: "Turbine Transport Airplane Developments," Harold Hoekstra, CAA Engineering staff; "Experience With Turbine-Powered Airliners—An Air Line Pilot's Viewpoint," Capt. J. T. A. Marsden, BOAC; "An Air Carrier's Views on Turbine-Powered Aircraft Performance Requirements," W. E. Rhoades, UAL Manager of Flight Engineering; and "Safety Aspects of the F-27 Friendship," H. C. van Meerten, Chief Designer, Fokker Aircraft. Some pertinent comments:

Harold Hoekstra, *on Certification of Turbine Transports:* "We are now

(Continued on Page 10)

The Annual ALPA Air Safety Award

E. A. (Ernie) Cutrell Is Recipient Of First Award Set By 14th Convention For His Development Of The ALPA Center Line Approach Lights

Capt. Cutrell receiving Award from Pres. Sayen, as Capt. Adickes looks on.

COVER: Courtesy Chicago Sun-Times

The first Annual ALPA Air Safety Award was presented during the Air Safety Forum Banquet by Pres. Sayen to Capt. E. A. Cutrell, veteran American Airlines pilot. The award, a plaque, cited Cutrell for his outstanding contribution to the advancement of aviation.

Cutrell received the award in recognition of his work in developing the ALPA Center-Line Approach Lighting System, which has now been adopted as the national standard and has so far been installed at 12 airports.

In making the award, Sayen pointed to Cutrell as an outstanding example of the pilot-specialist active in ALPA work, who is making singular and outstanding contributions to the progress of aviation.

Long, Active Career

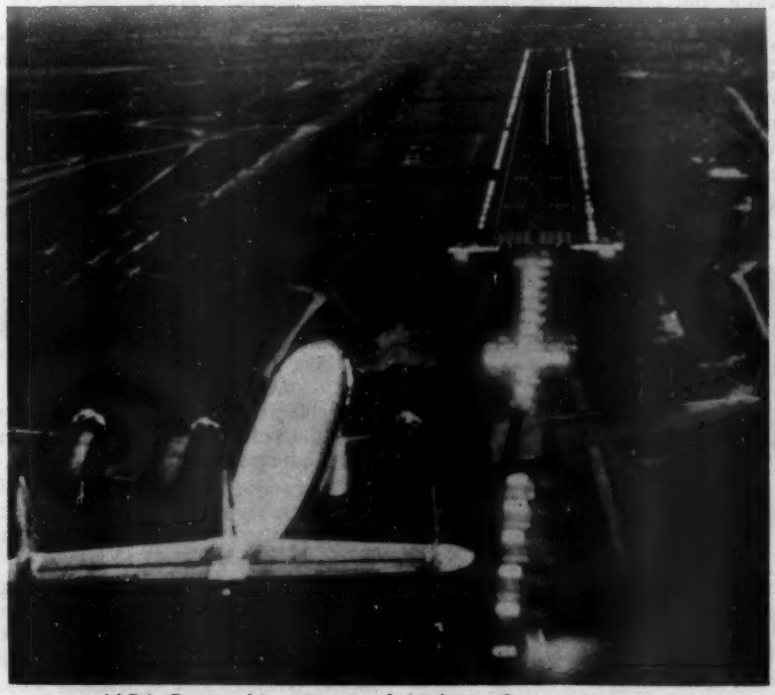
In addition to his work on approach lights, Captain Cutrell has had a long and active career as an air line pilot, in governmental civil aviation agencies, and military aviation. He learned to fly in World War I and soloed in 1918. He received transport rating No. 70 in 1927. He joined American Airlines in 1934 and is still actively flying.

In the 1920's as an inspector for the old Civil Aeronautics Authority, from 1927 to 1933, Cutrell developed the instrument flight rating and the original air transport rating for the Department.

During World War II, Cutrell was in charge of setting up an all-weather air line for the Air Transport Command, providing a vital logistic service for the Armed Forces. It was during that tour of duty that he conducted extensive research which has a vital bearing on the safety and efficiency of today's instrument flying.

He was also one of the pioneers in the development of the instrument landing system, now known as ILS.

In 1946, Capt. Cutrell received the Octave Chanute Award from the Institute of Aeronautical Sciences.



ALPA Center Line Approach Lighting System in action.

Hoekstra

faced with actually applying airworthiness standards to turbine-powered transports. Several months ago, the number of applications for certification of turbine engines became greater than those for reciprocating types. Applications are now on file for 6 jet transports, 4 executive jets, 9 turboprop transports and 6 turbine-powered helicopters. Of these, 14 are U. S. and 12 are of foreign manufacture. The first of these transports was the Viscount. The Britannia is scheduled to be certificated this year.

"The present Civil Air Regulations, which have been developed over a period of years, cover reciprocating engine aircraft and have done much to establish the outstanding safety record of American aircraft. They do not, however, cover many of the aspects introduced by turbine power. Good progress is being made through the annual review process and special spot changes to bring the Civil Air Regulations up to date for turbines. However, such a process must necessarily lag behind developments in this tremendously important and rapidly developing field. Hence, the CAA has followed the policy of studying new designs with the manufacturer as they develop. This permits the CAA to develop special conditions, therefore, for all of the turbine transport aircraft for which application for approval has been made."

Capt. J. T. A. Marsden, *on An Air Line Pilot's Experience With Jets:*

Marsden

"Once the pilot is competent in respect to fundamental changes in the aircraft's characteristics, then a turbine-powered aircraft becomes just another machine so far as handling is concerned."

Forum Banquet

The Forum banquet was held the evening of Wednesday, March 6. Bob Adickes (TWA) served as master of ceremonies. James Pyle, new Civil Aeronautics Administrator whose appointment was recently confirmed by Congress, and James Durfee, Chairman of the Civil Aeronautics Board were the principal speakers. ALPA's First Annual Air Safety Award, established by the 14th Convention, was presented to E. A. (Ernie) Cutrell, American Air Lines, by President Sayen in ceremonies held during the banquet *(see story page 9)*.

Third Day

The final day of the Forum was devoted to a panel on Pilot Training requirements and technical and research reports of the NACA and Wright Air Development Center.

Pilot Training

E. J. Bechtold, EAL Central Air Safety Chairman, served as chairman of the pilot training panel. Panel presentations consisted of: "An Air Line Pilot's View on Training Requirements," Capt. Ed Watson, EAL, Miami Area Safety Chairman; "Douglas DC-8 Pilot Training Program," J. L. Harper, Training Engineer, Douglas Aircraft Co.; "Experience With Simulators for Flight Crew Training," A. F. Bonnalie, Director of Flight Training, UAL; "Flight Crew Training—The Carrier's Viewpoint," Capt. Norman Warner, EAL Check Captain; "Boeing Views on Training Pilots for Jet Transport Operations," A. M. (Tex) Johnston, Chief of Flight Test, Boeing Aircraft Co. A few highlights:

Capt. E. R. Watson, *on A Pilot's Views of Training:* "The basic reasons for interest in training are: safety and economy of operation.

Watson

"The manufacturer is interested in training because he wants his customers' personnel to be familiar with the maintenance and operation of the aircraft so that the unit may go into service with the minimum of effort.

"The carriers should be interested in training so that its personnel can maintain and operate the aircraft for maximum utilization.

"The personnel operating the equipment should be interested in training in order to do a safe and efficient job.

"The Government Regulatory Agency should be interested in training to insure the safest operation for the traveling public.

"Thus, training is the concern of everyone in the industry, and cooperation between the groups most concerned, (the manufacturer, the carriers, the pilots, and the Government Regulatory Agency), is desirable.

"The carriers must bear the responsibility of adequately training the pilots, and the pilots must be ready to accept new training and new concepts."

J. L. Harper, *on The Manufacturer's Viewpoint of Training:* "The DC-8 flight training, as proposed by the Douglas Co. Flight Dept., will consist of three phases at the factory and a fourth phase at the customer's facility. Phase one will consist of two weeks ground school conducted by the Douglas Co. Service Dept. This two-week period will cover the area of general aircraft familiarization, its systems, structure, and systems familiarization. It is anticipated that flight personnel will begin their DC-8 indoctrination at this time. At the end of the two-week period, the maintenance specialists will branch out for detailed instruction in their special category.

Harper

"Phase two of the DC-8 training program will consist of one week's instruction given by a Douglas Co. engineering pilot. This instruction will cover airplane performance, aerodynamic characteristics, structural design limits, interpretation of aircraft operating date, weight and balance, aircraft systems operation—normal and emergency, all normal and emergency ground and flight procedures. During this week a member of the flight department will assist the engineering test pilot for familiarization of the aircraft systems' panel, and duties.

"Phase three of the DC-8 training program is the simulator. We are all quite naturally interested in economy of operation. It is this particular fact that has resulted in the development of simulators. As we all know, technical equipment is becoming more effective, and incidentally more complex. In addition to this, the initial investment is greater. Techniques and skill of operation have had to keep pace in order that the equipment continue to be operated safely and economically, therefore the only reason simulators are being purchased in increasing numbers is

(Continued on Page 16)

At The Forum:

Some Non-Technical Technical Talk

Did You Ever Think Of Air Safety As Being Like A Dachshund? Or A Case Of Arthritis? Or That It Can Be Effected By Something Called 'Murphy's Law'?

Jerry Lederer
Is air safety a dachshund?

Most of the topics covered at the Fifth Annual Annual Air Safety Forum produced some highly technical talk and discussions. But every now and then, the slide rule boys came up with some very quotable quotes to illustrate a point. We thought they were worth passing on, so here are a few choice bits of this non-technical technical talk:

Jerry Lederer, Director of the Flight Safety Foundation, on complacency in air safety:

"We may suffer from a false sense of security in air safety. This is nicely phrased in the following poem taken from Senator Kennedy's *Profiles in Courage.*

"There was a dachshund, once so long
He hadn't any notion
How long it took to notify
His tail of his emotion;
And so it happened, while his eyes
Were filled with woe and sadness,
His little tail went wagging on
Because of previous gladness."

Capt. Dave Halperin, TWA, on the meaning of air safety:

"I have been asked to prepare a paper on the subject, *Central Airline Safety Chairman's Procedure.* At first glance it would appear that to anyone who is engaged in Central Air Safety Chairman procedures, this would be a simple matter. Unfortunately, I do not find such

Dave Halperin
. . . Air Safety's like arthritis.

to be the case. The reason for this can be illustrated by the story of the two housemaids. These two women always rode the same bus together and had struck up a pleasant association during their trips. The association had continued for some time, when one Monday morning Liza noted that Mandy was not on her usual bus. This state of affairs continued until the following Monday when, much to Liza's surprise, there was Mandy again! 'Mandy,' she said, 'where have you been all week? I've missed you.' 'Oh, Lisa,' Mandy said, 'I've been ailing . . . I've been ailing somethin' terrible.' 'And what has been the matter with you?' asked Liza. 'Oh,' replied Mandy, 'I've been in bed with arthritis all week.' 'Oh, I see,' said Liza sympathetically, 'I know them Ritus boys, and that Arthur is the worst of the bunch.' And so I find that Safety, like arthritis, is many things to many people."

* * *

Carl Eck, on a basic principle of air safety:

"One of the primary precepts, which we have adopted in ferreting out hazards to air safety is Murphy's Law. We are not sure who Murphy was or is; quite possibly he didn't go far in school, but he does know human nature. His law is 'If a part can be installed wrong someone will install it that way.' This same principle is true when considering 'procedures' as well as 'parts.' Therefore, we must be constantly looking for ways to eliminate 'booby' traps whether they be mechanical, operation or procedural."

Carl Eck
. . . Murphy knew human nature.

Safety Forum Banquet

Nearly 300 guests attended the Fifth Air Safety Forum Banquet, Wednesday evening, March 6.

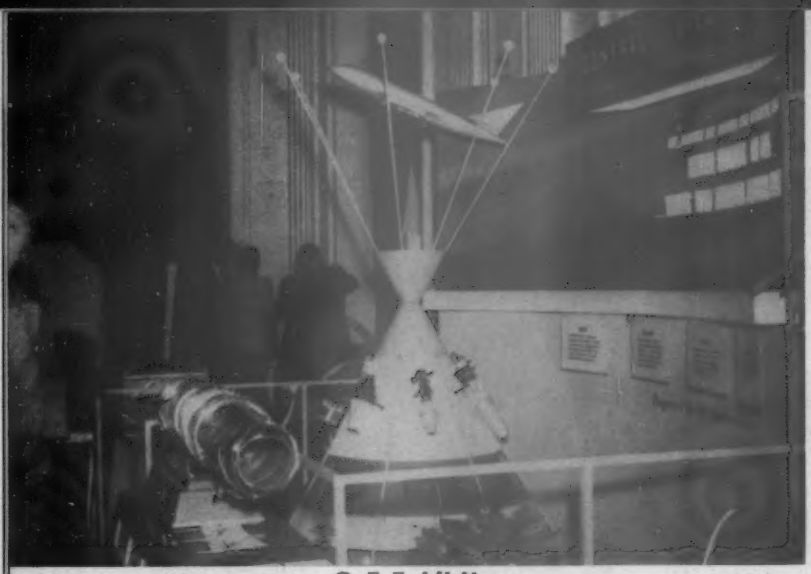
Banquet speaker was CAA Administrator James Pyle. James Durfee, Chairman of the CAB, also addressed the gathering, which witnessed the presentation of the first Annual ALPA Air Safety Award to Capt. E. A. Cutrell for his contributions in the development of the ALPA Centerline Approach Lighting System.

Other speakers included Pres. C. N. Sayen, First Vice President G. M. LeRoux, Oscar Bakke, Director, Bureau of Safety, CAB, and Col. J. F. Taylor.

Capt. R. A. Adickes, TWA, served as Master-of-Ceremonies of the Banquet.

15

Safety Forum Album



G-E Exhibit

General Electric exhibit centered around CJ-805 jet engine power plant for Convair 880.

Safety Device

Roy Holm (PAA) tries out Pacific Scientific Co.'s pilot and crew member restraint system.

At UAL Simulator

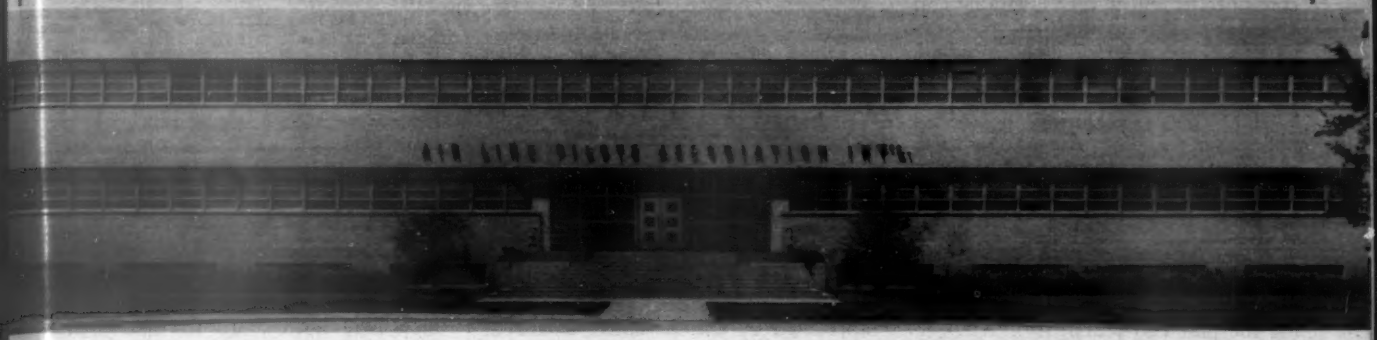
Delegates study mechanics in DC-6B cockpit at UAL Flight Simulator installation.

Jet Cockpits

Boeing 707, DC-8 flight deck picture displays attracted wide delegate interest.

State Of The Association

Part 4



(Editor's Note: This is the fourth installment of The State Of The Association Report *submitted by President Sayen at the Fourteenth Convention, highlights of which are being reprinted due to many requests for publication of this information. This installment covers the Association's Mutual Aid, Loss of License and Group Life Insurance programs, and the ALPA Federal Credit Union. The figures employed are as of October 1, 1956, when the report was written.)*

During the two years since the 13th Convention in 1954, all three security programs of the Association have grown in membership benefits, and stability.

Mutual Aid

Since 1954 when Mutual Aid Association membership totaled approximately 3,000, there has been an influx of more than 3,500 additional participants, bringing the present total Mutual Aid Association membership to 6,890 as of October 1, 1956. The basic provisions under the Mutual Aid plan remain unchanged. It provides a means for a pilot to insure his income for a twelve month period starting after sixty days (average sick leave) and continuing through the fourteenth month of any sickness or disability in an amount of either $250.00 or $500.00 monthly depending on each participant's income and preferences.

Since its inception in June 1953, disability benefits totaling $373,454.82 have been paid to 185 claimants. During the same period, $33,000.00 has been paid out in death benefits, with the average quarterly cost to participants $4.09 and $7.58 for Class I and Class II participants respectively. The average age of the 6,890 participants is 37.8 years, and the average age of claims is 39 years. Presently, over $215,000 of the monies deposited by the participants is conservatively invested, with a dollar return on investments since January 1, 1954 of $12,484,000, which income has been used to defray administrative costs in operating the program, making quarterly assessments almost completely a reflection of claim costs.

Operating as a separate entity, under its own By-Laws and Board of Directors, the Mutual Aid Association employs three persons and has acquired $3,500.00 worth of office and accounting equipment. Some of the major administrative costs incurred since the program began in 1953 and borne by the participants in their quarterly assessments are: salary costs $18,000.00; equipment and fixtures $3,500.00; stationary and supplies $2,200.00; postage $2,000.00; and telephone and telegraph $225.00.

MAA Board Of Directors

S. J. Devine (UAL), President; R. McDaniels (AA), Vice President; R. Bolden (TWA), Treasurer and General Manager; C. E. Cochran (OZA), M. E. Swanson (NWA), R. E. Dooley (AA), W. R. Vance (CAP).

Secretarial And Clerical

Lucille Shimek, Gladys Schaefer, Frances Burke.

Loss Of License

Showing even greater growth than the Mutual Aid plan, ALPA's Loss of License disability program now embraces more than 10,000 participants. An annual premium of $50.00 became effective November 1, 1956 in order to produce sufficient premium income to meet the claim liabilities incurred under the policy. Claims have been received from 73 participants since the inception of the coverage. Thirty-one claims have been approved for payment; twenty-eight claims are in the process of being investigated; eight claimants have either returned to work or died, and the claims of six participants have been denied.

Premiums paid since the inception of the program total $385,943.93. During this same period, claim liabilities have been incurred in the amount of $1,193,823.00.

Claim experience falls in the following categories:

Respiratory	2
Neurological	11
Psychiatric	14
Cardio-Vascular	13
Gastro-Intestinal	5
Genito-Urinary	2
Musculo-Skeletal	8
Ear	1
Eye	9
Endocrine	3
Miscellaneous	5
	73

There is some indication that stability in the annual premium may soon be achieved. In the negotiation with the underwriters, in setting the $50.00 premium rate, we were able to secure a

guaranteed rate for a three year period ending November 1, 1959.

Group Life

The third phase of the Association's security program, which provides low cost Group Life insurance protection, continues to reflect very favorable cost experience. During the first year's experience, a $38.00 dividend resulted, bringing the net cost to each participant to approximately $34.00 for $10,000 coverage. During the second policy year ending August 1, 1956, mortality experience was again favorable, resulting in a dividend of $30.90, with the resultant net premium cost of $41.10.

Enrollment in the Group Life program presently totals 6,843 members, a growth of approximately 1,600 during the past two years.

Since the program's inception, death benefits totaling more than $300,000.00 have been paid the beneficiaries of deceased participants.

A review of the accomplishments of ALPA's integrated insurance program during the past two years again emphasizes the great value of these programs for ALPA's membership:

- Making available protection for pilots against the most basic insecurities in the air line piloting profession —physical disqualification on a temporary or permanent basis.
- Enabling pilots to save more than their annual dues each year on insurance premiums alone—an excellent demonstration of the advantage of cooperative effort.
- Increasing the value of ALPA negotiated retirement programs since income is provided in the event of physical disability, which enables the pilot to postpone drawing retirement benefits and hence increasing his retirement income approximately 6 per cent per year for each year postponed.

The insurance programs of the Association—Mutual Aid, Loss of License, Group Life and now retirement programs, are all essential parts of an integrated plan to increase the security of the pilot and protect and enhance his standard of living. One program supplements another to reduce the cost and increase the protection. The programs are flexible so that maximum efficiency in individual estate planning may be achieved. Many options are provided in the retirement programs to enable family protection as well as retirement income.

These programs are now an essential part of every pilot's job security. He cannot afford to be without them.

Insurance Department Staff

S. Mohawk, J. Kovach.

Secretary And Clerical

Marie Lamont, Ann Cherry, Ester Renkar.

ALPA Federal Credit Union

Purpose

To promote thrift among its members by affording them an opportunity for accumulating their savings and to create for them a source of credit for loans for provident or productive purposes.

History

Originally conceived by resolution of the Board of Directors at the 9th Convention, and organized by a committee appointed by the Executive Board at its first meeting in May 1947, ALPA's Credit Union became an operating entity on December 29, 1947, when the charter member shareholders met to elect a Board of Directors. On January 16, 1948, the Directors met and the Association's first subsidiary service organization was under way.

Growth

On September 30, 1948, the assets of the Credit Union totaled $34,571 with 411 members participating. Loan volume on that date totaled $14,320. A 2 per cent dividend was paid on deposits in 1948. A year later, on September 30, 1949, assets had grown to $124,363, membership was 1015, and loan volume had reached $87,195. For 1949, depositors received a 4¼ per cent dividend.

Below is outlined the growth during the years following:

Sept. 30	Assets	Outstanding Loans	Number of Members	Dividend for Year
1950	$ 389,057	$ 216,572	1,587	4%
1951	438,412	297,762	1,862	4½%
1952	583,239	268,674	2,099	4%
1953	998,087	399,640	2,414	3%
1954	1,046,287	612,585	2,704	3½%
1955	1,011,426	819,522	3,389	4%

The Board of Directors of the Credit Union, in the spring of 1954, reduced the interest rates effective June 1, 1954, to 1 per cent per month on the unpaid balance up to $400, and ½ per cent per month on the amount in excess of $400. They also placed a maximum of $5,000 for a loan to an individual member with the exception of cases where a share account is offered as collateral. In this instance, they may borrow up to their share holdings. On March 13, 1956, a maximum of $10,000 was placed on individual share accounts. This has no effect whatsoever on accounts which exceeded this amount prior to that date. At the present time, approximately 81 per cent of our assets are invested in loans to members. Beginning January 1955, members of the Association were granted the privilege of paying their dues on an annual basis at a discounted rate. A good many borrowed from our Credit Union for this purpose.

Staff

C. E. Solle, Geraldine Nelson, Elaine Olson, Ruth Stima.

(Continued in next issue)

Fifth ALPA Air Safety Forum . . .

(Continued from Page 10)

because they are accomplishing a required job, in this case—training, in the safest most effective and economical manner."

Capt. Warner, *on The Carrier's Viewpoint of Training Requirements:*

Warner

"When we realize the importance of keeping crew members properly qualified through better training, supervision, we will have taken a mighty stride toward the solution of a major safety problem."

Other Presentations

Afternoon sessions on March 7, which ended the Forum, were devoted to three technical papers. Two of them—"The Take-Off Meter" and "Tire to Runway Braking Coefficients" were delivered by Melvin Gough, Head of Flight Research, NACA. J. H. King, Test Engineer, Wright Air Development Center, reported on "Flight Test Evaluation of Altimeter Position Errors."

A Concensus

In a sampling of opinion taken at the close of the Forum the general concensus was: it was the finest and most thought-provoking and productive ALPA-sponsored safety forum of them all.

The Airport's Effects On ATC

The Inadequate Airport Capacity Problem Is Every Bit As Serious As An Antiquated ATC. Improvements To One Without The Other Will Only Bring Token Relief, Claims the Author

By Capt. J. D. Smith, CAP

Chairman, ALPA Air Traffic Control Study Committee

At long last, it is now possible to conclude that all segments of aviation wholeheartedly agree that traffic control is one of the most serious problems facing the industry. It is quite simple to conclude that the inadequate traffic control problem is fully recognized and strenuous efforts by the responsible agencies will, in the not too distant future, bring about improved utilization of the airspace in a manner consistent with Safety.

For the purpose of this paper, let us assume therefore that the traffic control system is improved to where we actually have an efficient utilization of airspace which is consistent with Safety and acceptable to all users. Will this improved traffic control system by itself,

1. Eliminate the present stranglehold preventing further expansion of aviation;

2. Permit greater schedule reliability;

3. Permit closer adherence to projected aircraft utilization?

The answer quite simply is "Positively No."

The primary factor which will determine the degree of efficient use of airspace consistent with Safety is the airport. Therefore, it is quite imperative that immediate attention be directed to raising airport efficiency so as to be capable of continually maintaining at least the same capacity of the traffic control system.

Current Control Thinking

To date, improved control efficiency is being based primarily on flights to or from a runway. Present thinking indicates that 40 landings an hour during instrument conditions is a realistic figure. Also, under similar conditions, 40 departures an hour can be accommodated. These figures are based on utilizing two separate runways. If only one runway is available for landings and take-offs, it then becomes quite difficult to achieve even 40 movements an hour.

Should we have a runway design permitting one strip for landings, another for take-offs and both can be used simultaneously, it then is possible to achieve at least 80 movements an hour. The figure 80 movements an hour is also quite close to that reached by IFALPA concerning the London Airport. It can, therefore, be concluded that 80 movements an hour during instrument conditions represents a sound operation provided, of course, the airport has the proper runway design.

Airports Cause Delays

At many airports today, the primary reason for delays is the airport itself, not the traffic control system. At such locations, and in spite of spending millions to improve the traffic control system, it is very doubtful whether substantial gains will be achieved as concerns increased movements through the airport. What can be gained by being able to move 80 aircraft an hour if the airport can only handle 40 flights an hour?

It should be recognized that we have known for some time how to handle today's volume traffic-controlwise. Our primary weaknesses have been the lack of tools, proper application of know-how and manpower to do the job. However, at present, efforts are being exerted to overcome these weaknesses. The problems are recognized—many of the solutions are known—and consequently, we can look forward to improvement traffic-controlwise.

But, is the airport problem recognized? Do we have solutions for the airports? We think not.

The pilot group has been expressing concern over the airport situation for years. We did the same thing about traffic control and, eventually, others agreed with our conclusions of years ago. Maybe some questions concerning airports will alert others to appreciate the operational problems we are faced with.

Questions On Airports

For example:

▶ Where in the United States do we have an all-weather airport? Answer: No place.

▶ Where do we have an airport with lowest approved landing minimums on more than one runway? Answer: No place.

▶ Where do we have an airport within which we can safely maneuver the aircraft on the ground during all-weather conditions? Answer: No place.

▶ Where do we even have an airport that properly outlines the beginning of each runway? Answer: No place.

▶ Where do we have an airport that can continually handle 80 movements an hour? Answer: No place.

In conclusion then, operationally speaking, where in the United States do we have a satisfactory airport? Answer: No place.

Partly as a result of this overall airport deficiency, it has been necessary for the carriers to voluntarily limit scheduled service to many cities for years. An improvement in traffic control capacity will not necessarily result in more frequent service to these areas unless the airport capacity is also increased.

Falling Behind Foreign Carriers

Reliability of service to all airports cannot be improved unless already known all-weather tools are implemented. Due to the slowness in this country to install proper visual aids, the United States has fallen behind many of the foreign carriers in continued reliability of service. This point is extremely distressing when it is considered that we have the know-how and the tools available to do the job. Reliability of service becomes more of a problem when it is considered that each new aircraft is becoming less forgiving, requiring more proficiency but yet is still required to utilize inadequate or improper tools.

Concerning airports, all we can outline is what we see. We know, for example, that Federal Aid has been increased, however, we noticed very little improvement in operational facilities.

Complicating Airports

We do note, however, the ever-increasing appearances of some of the greatest man-made obstructions yet to appear on airports. Evidently, the race

is on to see who can build the largest, most inconvenient terminal building in the country. About the only advantage to this construction derby is that terminal building designs are making it almost as complicated for the passenger to reach his gate as it is for the pilot to locate same.

Terminal buildings have a very direct effect on use of the airspace. If passengers and cargo cannot be efficiently handled, this delays flights. By the time you incur a passenger and bag handling delay, you have defeated the advantage of a more efficient traffic control system.

Future Problems

Consider that in the not too distant future, we will be carrying upwards of 100 passengers per flight, try to visualize where we have ticket counter space to accommodate these people; consider that many new terminal buildings are already antiquated and it may be possible to appreciate why we are concerned with inadequate and improper terminal buildings. Couple this with the fact that much of this money could be directed toward needed operational improvements and you may visualize why so much concern exists over the airport situation.

To date, no one in this country has developed an airport system that will properly handle the volume of traffic which the future traffic-control system will accommodate. It therefor becomes quite imperative that emphasis be directed to insuring that the airport and traffic control system can operate together at least to the capacity of the traffic-control system.

The inadequate airport capacity problem is every bit as serious as an antiquated traffic control system. Improvement to one without bettering the other will bring only token relief.

Serious thought should be given to freezing all Airport Federal Aid except that which will increase operational capacity of the airport.

Needs Outlined

We have a crying need for:

- Proper approach lighting with condenser discharge flashing in sequence;
- Adequate runway threshold lighting and marking;
- Sufficient runup areas so as to be able to bypass other aircraft;
- Runway flush lighting;
- More straight-in instrument approach procedures at lowest approved minimums;
- Improved airport parking areas;
- Properly spaced parallel runways;
- Adequate taxiways;
- High speed turnoffs,

just to mention a few.

Airport operators should be required to bring airport capacity up to traffic control system capacity with the help of Federal Aid before any Federal Aid is approved for other than direct operational requirements.

This is a most important point when considering the airport is a useful tool during times of an emergency. No one can deny the importance of airlife capacity during an emergency. The defense of our country dictates that airport capacity must always be consistent with traffic control system capacity. This can only be accomplished through proper planning.

Proper airport planning requires some changes in basic philosophy, particularly at high density areas. Initially, it must be accepted that the days of the amateur airport operator are gone. So are the days when the position of the airport manager was handled as a political plum.

Big Business

A commercial airport is big business. In many areas, it may represent the largest industry in a community. Therefore, it must be treated accordingly.

The primary purpose of an airport is to develop and accommodate the needs of the air-minded. This is true whether its services be applied to the travelling public, users of the airspace or other segments of the aviation industry.

It is not a piece of property on which gigantic buildings are erected, inside of which one can purchase anything from a needle to a submarine.

Committees must be educated to realize that an adequate airport is one of the soundest investments that can be made. In the not too distant future, the prosperity of an area will probably depend directly on the capabilities of its airport. Proper planning will have a direct effect on local business or the development of same.

Millions of people have yet to take to the air. Materials shipped by air are in its infancy. The air line industry will not stand idly by and let this potential revenue slip through its fingers. In many areas, the carriers desire to increase service but are unable to, due to the airport situation.

In the next few years, air line lift capacity will increase manyfold. Increased public acceptance of air travel will do likewise. There will be a constant increase of flight movements and passengers. Reliability as concerns arrivals and departures will be the primary selling point for developing greater mass use of air travel. This sharp increase will pose a challenge to all airport operations.

All-Weather Airports A Must

It is quite imperative that all-weather airports be in existence when the jets arrive. Actually, we need them now. This capability can be easily accomplished by applying present knowledge.

Due to the economics connected with extending runways, the users, manufacturers and airport operators should establish maximum runway length criteria for air carrier aircraft. Once this criteria is established, the manufacturers should be required to develop performance characteristics within such limits.

Steps should be taken to design a basic runway and taxiway system which will permit continuous flow of aircraft during all weather conditions in a manner that will not adversely affect capacity of the traffic control system. Operational flexibility must receive first consideration. Once this point has been satisfied, it then becomes appropriate to consider the other phases.

Maximum attention must be given to developing a truly all-weather operation. This is needed from a commercial standpoint as well as a military objective. An all-weather operation, consistent with safety, is the greatest advance aviation could make. A tremendous amount of time and effort has been directed towards this improvement. Many of the solutions are known—standards have already been established. It is extremely distressing to note that we have only one runway within the United States that we consider properly equipped for today's operation. We view with utmost concern the snail's pace at which the airport capabilities are attempting to eventually satisfy demands of the users.

Fears Economic Penalties

This lack of foresight and appreciation may well mean that airports in the United States as a whole will not be capable of satisfying traffic control system capacity during all-weather conditions for at least 15 years. Should this prove true, the industry will surely be subjected to substantial economic

penalties. Furthermore, should the trend of attempting to continue squeezing a quart into a pint persist, the level of safety cannot help but be lowered.

There is no doubt that the challenge facing the airport operator is tremendous. It must be accepted that airport flexibility during all weather conditions is the key which will determine the extent to which aviation can expand.

What causes serious concern is that to date, no one has come up with the answer. If the same time element is required to develop satisfactory airport capability as is being taken to accomplish the Common System, the entire aviation industry will be faced with a most serious condition.

We urge that every effort be applied towards developing airports capable of handling movements in a manner consistent with traffic control capacity during all weather conditions consistent with safety.

The Air Line Pilot: His Relation To Air Safety

'Safety' Is Only Relative, Dependent On How A Thing Is Done And By Whom

By Capt. F. E. W. Smith
Canadian Air Line Pilots Association

The most important word in the language of airline pilots is "safety," a word and a thought which we can never ignore. So vital is it that this series would be inadequate and incomplete if space were not allotted to its contemplation.

A popular misconcept is to allot positive value to the term "safety." We say that this is "safe" and that that is "unsafe," as if with "this" no harm can possibly befall us and with "that" we are sure to come to a bad end whatever we do. This is wrong definition, for the word has only relative value, being more descriptive of how something is done, and by whom, rather than it is of the thing itself.

Always Taking A Risk

To explain, there is nothing which man does which does not involve taking a risk of some sort. People have killed themselves by getting out of bed, by eating, and even by sleeping. No one can go through a single day without taking innumerable risks of one kind or another, most of them small, some of them perhaps big. The term "safety" does not mean freedom from danger because there is no such thing, danger being about us always. It does mean the application of skill and knowledge to a given situation of risk, which results in a satisfactory reduction of the hazard.

Hazard and risk are terms which have positive value, in that they describe the amount of danger inherent in any given activity. Most of the duties of life contain little risk, some are very hazardous, and some so dangerous that few men, if any, will attempt them. These we say are unsafe, but we are misusing the term, for they may be unsafe or they may be safe depending on the knowledge, skill and suitability of whoever is doing them. A man conditioned to an undertaking of great hazard, who fully understands the dangers which oppose his success, and who possesses or has devised a "safe" method of combatting these dangers, may actually be safer among his risks than he might be doing things which he considers are without hazard. The term "unsafe," as applied to any dangerous undertaking, relates to the improbability of avoiding the risks which are inherent. When methods have been devised which give the individual an acceptable chance of success over these risks, the activity becomes "safe"—for those who understand the methods and who are fitted to apply them. It is still "unsafe" for those who are not suited and who remain in ignorance.

One Example

There are innumerable examples of the truth of this statement and only a few days ago the writer witnessed an excellent one. A high rigger threw his hat in the air from the top of a one hundred foot tree—and beat it to the ground. To say the feat was hair- raising is an understatement. To say it was risky is indisputable, for the hazards of that mad scramble down the tree were most evident. But to say it was unsafe is wrong, for the tree climber was a professional performer who had been doing the same stunt twice a day for a number of years, and who has never been hurt doing it. Similarly, there is a man in California who has made a good living for many years crashing aircraft for the movies. He has at times been hurt, but he has not yet been killed, even though he makes an occupation of something at which most people get killed on their first try. It is obvious that he has devised safe methods of doing something which is very dangerous.

When a stunt man finally gets killed doing his specialty, it is popular to note his passing with the observation that his stunt was most unsafe. It would be more correct to say that his dangerous occupation had become unsafe for him at the moment of his accident and it is probable that one or more of three reasons will explain its cause. First, he may have been unsuited, for men often display more nerve than good judgment in their ambitions. Second, the performer, his awareness of danger dulled by overfamiliarity with his act, may have become careless in some way in the application of his techniques. Third, some hazard, unforeseen and hitherto unencountered, may have, in this instance, transformed an act which had been safe for him into one which was unsafe, and he had not been able to solve his problem in the limited time available to him.

Known Dangers

The man who wishes to do the hazardous and live, must first be suited to his task. Then he must maintain a constant appreciation of the danger of what he is doing, and hold in deep respect the forces of destruction which are about him. He must, too, be vigilant in his search for hidden dangers, ones which he has not encountered and hopes he never will, but which may face him some day in a most unexpected way. When he has discovered these he must try to devise techniques which will defeat them, for if they catch him unawares he will be lost.

This abstract discourse on the relation between hazard and safety, and the life and death of the stunt man, is appropriate for pilots because flying is one of the world's most hazardous occupations. Yes, we who are accustomed to think of ourselves as sober and cautious men, pillar-of-the-community types, are actually closely related to the high rigger and the high wire performer. For flying is simply loaded with risks. We are as surrounded with them as we are with instruments: risks of engineering, of construction, of maintenance, of performance, of traffic, of

weather and of our own abilities. A good way of evaluating the actual net hazard of the occupation is to contemplate the chance which an ordinary individual, untaught and ignorant of aircraft, has of stepping into a modern airplane and successfully completing any kind of a flight. The probability of such an attempt ending happily is comparable to that of the same individual, no less well prepared, duplicating the feat of the high rigger.

Practice Helps

But as the rigger, with knowledge, skill and practice is able to perform his act with safety, so is the pilot. We learn to fly. We study out the many hazards inherent in our occupation and are taught techniques which remove them. This is the only safety in flight, for the risks are ever present, unchanged from the days of the Wright brothers. It is the improvement and invention of technique, both of pilot and engineer, the enormous increase in knowledge of the air, of airplanes and of how to build them, that has made aviation the safe, effective transportation of today. These spectacular advances have not, however, made the air one bit less hazardous.

It was pointed out above, assuming suitability, that when an accident occurs in a hazardous occupation there are two causes. Either the individual involved has become careless, or has been faced with some hazard new to his experience which he has been unable to combat. This is always true in the air. Of carelessness little need be said, for its consequences are impressed on pilots at the earliest age. But it is perhaps advisable to point out that mistakes of carelessness are the errors of experienced men and occur because they have lost the awareness of danger which is essential to their survival. The carelessness of the green but potentially competent pilot is an indication of his lack of skill.

Types Of Dangers

New hazards must be of a type which cannot be simulated in training for otherwise the pilot would be instructed on them. The word "new" also relates to the experience of the individual concerned for it is possible that the same thing has confronted others. Such are of two main types: those which can be controlled and those which cannot be controlled. A pilot is able to learn much about the first type for if such has happened to anyone who has been able to succeed over it, a contribution to the general knowledge is made. A pilot can only conjecture on the second type, for there is seldom a witness reporting the encounter.

There are two ways of seeking safety from the new, or as yet unmastered, hazard. First is avoidance. If you feel unequal to the risks of tree climbing—don't climb trees. Avoid flying maneuvers which might cause destruction of the machine, unless properly equipped and prepared to meet the emergency and armed with a plausible excuse to top off the parachute ride home. If your aircraft is a single engine VFR job and you are not competent to fly on instruments—don't take an IFR jaunt anywhere, any time.

The second way is to expand the limit of what can be done safely by education and equipment. This involves learning all there is to know about the hazards which can normally be expected, and about as many unusual ones as one can. It involves conditioning (meaning the attainment of a mental attitude) and of physical skill, which will enable the man concerned to do what he knows should be done when required. And it demands possession of proper tools for the job. The tree climber does not perform his act in running shoes, with a clothesline safety belt. He has spurs, a wide belt and a very special rope. So does the pilot need a good aircraft, proper instruments and sufficient radio equipment before he can make a regular feat out of flying to schedule.

Defining Terms

It has been shown that the term "safety" means the doing of something dangerous in a way which removes the risk. It was also pointed out that it is popular to misdefine the term and use it as an expression of the actual danger which is involved. People would do better if they said: "This is unsafe *for me,*" rather than say: "This is unsafe." The latter expression limits the experience of he who uses it for, having proclaimed the act unsafe, positively and definitely, his only recourse is in avoidance. Had he used the first expression he would have recognized the possibility that, with training and experience, it could be safe—for him—and would thus permit an expansion of his capa-

Pilot Wins UAL's Highest Award

Capt. R. L. Wagner

A veteran ALPA member, holder of Membership No. 13, has been awarded the highest honor that United Air Lines can pay any of its 20,000 employees. He is Capt. R. L. (Rube) Wagner of Atherton, California, member of Council 34 San Francisco, who was presented with the "President's Award" by UAL President W. A. Patterson during the company's recent "Flight Plan" meeting in Chicago.

The award was established last year to honor the employee who surpasses all others in service over and above the requirements of his immediate job. Captain Wagner was cited for his "outstanding contributions and pioneering efforts in the field of commercial aviation."

Presently the number-one pilot on United's seniority list, Captain Wagner learned to fly in 1919 with the U. S. Army and has actively participated in the entire development of air transportation since that time.

He served as a pilot with the Post Office Department from 1923 to 1927 and subsequently flew with Boeing Air Transport, a United predecessor company. In 1931, when BAT became part of United's coast-to-coast system, Wagner remained as pilot in the Western Division.

During World War II, Wagner was assigned to the company's military contract operations for the Air Transport Command, flying between San Francisco and islands in the Pacific. When United began its scheduled operations to Hawaii in 1947, Wagner was one of the first pilots assigned to the run—an assignment he still holds. More than 30,000 hours are recorded in Captain Wagner's flight log—equal to nearly 3½ years aloft.

bilities. Pilots are no different than anyone else in their tendency to limit themselves in this way. While we would all disagree with an average man's statement that flying is unsafe, we do place arbitrary limits on what we will do in the air, and say that certain flying operations are unsafe (*e.g.*, tornado flying). We neglect to add the words "for us," and thus rule out the possibility that some day a technique may be devised which will make such flying safe. We see our safety in avoidance which, until we are equipped to meet the hazard, is of course the only thing we can do.

Unfortunately pilots cannot afford the luxury of avoidance the way the man in the street can. Avoidance, or the selection, of risks he is prepared to accept, is of little value to him for he is in a position where he must meet that with which he is confronted. The sooner he reaches a state where he is competent to overcome many more dangers than he is liable to meet, the sooner his factor of safety becomes acceptable. The pilot is in exactly the same situation. If, for example, he has decided that it is unsafe to fly on instruments because, perhaps, of the dangers of ice and turbulence which lurk in clouds, he will seek to avoid all cloud flying. This is fine—except that some day he will not be able to avoid the cloud and, because he has limited his skill and knowledge, will be in great danger in a situation which another pilot would term routine.

An Illusion

In any dangerous occupation, and flying is such despite statistics, the safety of avoidance is largely illusionary. The only safety is in care, which is a must, and competence, which is skill developed through study, practice and experience. The attainment of this competence is a continuing, continual process for no one can ever say he is master of *all* emergencies. Any pilot who stops his progress to an ultimate mastery of the air, who says to himself that he knows all he wants to, or needs to, know of flying, is deluding himself and is placing himself in a position where he must seek safety in avoidance. Once he has so decided his operation ceases to be safe.

Anticipation of emergencies, devising means of surmounting them, improving on existing techniques, all are highly profitable ways for a pilot to spend his time. For one thing, such activity makes him safety-minded, not chance-minded. For another, by continually expanding what he can do, it makes him progressively safer in the air, putting real value into his experience. No wild fancy is too improbable for consideration. Witness the incident over Korea, where a pilot who has passed out from lack of oxygen was brought down to a safe altitude by two other pilots. Had these men not previously conceived of just such an emergency, and thought out the solution, their friend would surely have died.

A Traveler's Reflections: People Are Nicer In The Air

By Phyllis Battelle

(Reprinted by special permission from Miss Battelle's column Assignment America, *syndicated by* International News Service.)

I love going places by airplane — and not because I get there faster, or because the meals are free, or even because I prefer gazing at God's glowing advertisements than at Burma-shave's.

It's because people are nicer on airplanes than they are in cars, buses, ships, trains and offices.

The gentlemen remove their hats and let the ladies take the window seats. The ladies smile with a graciousness seldom observed in their parlors. Even the children are suspiciously polite and innocent.

Scarcely anyone complains if the coffee is cool, or the beef slice small.

Those who would think nothing of stepping on a neighboring foot in subway or theatre are cautious as they plod through a plane. And those who would mutter "y'crazy oaf!" when stepped upon in subway or theatre, only smile bravely if they are stumbled over at 18,000 feet.

"Never mind, it doesn't hurt a bit," they will nod pleasantly.

Reverts To Infant Status

The pilot is Sir Galahad, the hostess is Florence Nightingale, and it is Christmas from coast to coast in an airplane.

The reason for all this can be summed up, I suppose, as a mass reverence for the power of nature. When a man boards a plane, fastens his seat belt and listens for off-beat noises in the roaring to life of the engines, he is consciously, unconsciously or subconsciously reverted to a sort of infant status. . . .

He's utterly dependent on others — in this case, a big man who knows how to fly this boat, and God. There is nothing he can do to help. It is humbling. It makes him feel small. Feeling small makes him want to be better.

So he talks gently to the ladies, and thanks the hostess no matter what kind of dinner she serves him.

The politeness of airplane passengers is even more pronounced when the weather is inclement. The deeper the fog or the bouncier the winds, the more perfectly behaved are the passengers. Rarely is there any hint of panic, even among first-time flyers, when a plane forges through an uncomfortable storm.

On Good Behavior

Rather, there is a reverent calm, while almost everyone lends silent support to the pilots up front and overhead. At this time, of all times, ladies and gentlemen are on their best behavior, so as not to bother the captains.

In the last couple of years, people have come to take air travel so much for granted that there has been a slight let-down in the perfection of air-borne manners.

On smooth, sunny flights, you will find an occasional woman snapping irritably at the hostess, for instance; and in the cocktail lounges of bigger planes, a man will sometimes forget he is close to heaven and act a bit like the devil.

But all in all, you will find still that the air is a far sweeter circuit to travel than the land or sea. For mankind still feels a trifle insecure when he finds himself, bottomless and small, in the sky.

For the love of human nature, may he never wake up completely to how safe an airplane is!

Aviation Facilities . . .

(Continued from Page 3)

ommend a single line structure composed of full-time scientific, engineering and operationally experienced civil and military personnel.

Where requirements are decided today by adversary tactics and arbitrary voting, we recommend that facilities be established to obtain scientific and experimental data on which sound decisions on equipment and other characteristics can be based.

Where it is attempted today to arbitrarily specify individual equipment

Frye's Famous 'Airline' Oxfords

A Real Treat For Your Feet

Handsome foot-flattering style. Wonderfully light weight and comfortable.

NOW BY MAIL (postpaid) OR COME IN BETWEEN FLIGHTS AND GET THEM.

Brightly polished calf leather, fully leather lined, leather soles, rubber heels.

Satisfaction guaranteed. ORDER NOW. Enclose check or money order.

BLACK OR BROWN. Men's sizes 6-12, ABCDE, from stock. **10.95**

Sizes 12½-14, ABCDE, made to order..... **12.95**

WRITE FOR FREE CATALOG

TODD'S

Dept. 4AP, 209 S. State St., Chicago 4, Ill

Frank South **LUGGAGE**

BIGGEST VALUES! LOWEST PRICES!

Guaranteed Top Quality, Top-Grain Cowhide.

DISCOUNTED 25% to 30%

No. 666

Built to carry a rough load. Very roomy but not bulky. 2 collapsible compartments. Reinforced ends and bottom. Heavy duty zipper with steel frame. Top will stay open. Colors, black, tan, ginger.

MONEY-BACK 5-day examination guarantee.

16" x 7¼" x 12", $19.95 18" x 8½" x 13", $22.95

20" x 8½" x 13", $24.95

Add 10% Fed. Tax. $1.00 shipping. No. C.O.D.'s.

FRANK SOUTH LUGGAGE

AIRLINE EMPLOYEE SUPPLY

Kit Bags, Catalog & Brief Cases. Write for literature.

P. O. Box 12211, Fort Worth 16, Texas, Dept. P

pilots employment agency

Teterboro Airport 5, N. J.

3315 Burbank Blvd., Burbank 5, California

characteristics of equipments to develop, or regulations, or procedures, or skills, we recommend modern techniques based on scientific methods to aid a logical process of progressive decision making.

The most important elements of this process, we believe, are the use of full-time operational-engineering teams, and the use of actual flight experiments to establish requirements. Actually, this was done on a large scale for the first time for civil aviation by Special Working Group 5, when they set up a test at the All-Weather Flying Division of the Air Force in 1950. Theoretical procedures developed by SWG-5 were tested for the first time there, and led eventually to general introduction of radar procedures for the terminal area.

Recommendations

In order to facilitate timely introduction of improvements into operation, we recommend that additional formal processes be utilized — extensive in-service testing in different geographical areas, rotation of operational and engineering personnel into experimental environments, periodic public demonstrations, furnishing data to regulatory bodies, early reorientation of training programs, and establishment of educational and indoctrination programs for users.

The modernization effort we recommend will take some time to initiate and some further time to produce visible results. Will those results come too late to avert a serious crisis in aviation traffic? We think not. Since we started our study last June, significant steps have been taken, with apparent success, to improve today's air traffic control system, essentially by putting to active use in critical areas certain techniques and improvements that have been at hand for several years. We have noticed, in our review of today's system, several other short-term possibilities for improvement that seem to us to be needed to augment the current CAA program, and have already recommended these to the appropriate people.

Secondly, we have rather definite views as to how the modernization effort should proceed, at least at the outset. It should work, we believe, toward putting into early use for the management of aviation traffic, some of the technical developments that are already available, or nearly so.

We, therefore, recommend a three-part national program to start immediately: the first to augment the current CAA implementation program; the second to exploit existing technology; and the third to establish a continuing capability for modernization of the system.

▸ **Part I:** The first or short-term operational improvement phase for traffic control, involving the use of known techniques such as dispatch methods, dual stacks, and segregation by speed class, requires a specific type of additional effort entirely within the existing organizational structure.

1. Formulation of an operational group within CAA to analyze bottlenecks in air traffic throughout the nation, and apply known improved techniques.

2. Services of an operational research group and user personnel, on a short-term basis, to back up the operational group in determining optimum application of the improved techniques in complex traffic situations.

3. Improvement and expansion of the existing CAA-TDC simulation facilities to train controllers in the use of new procedures.

4. Experimental flight checkout of the modified traffic configurations to insure operational safety.

5. With the introduction of enroute radar, a specific concentrated effort is necessary to develop a doctrine for its use, evaluate it, and integrate it with other existing and planned radar networks.

▸ **Part II:** The second part, directed

Let Us Help You Coordinate

Group, ALPA And Life Insurance, Social Security, And Other Assets Into A Family Income Program

SCHIPPLOCK SALVESEN

INSURANCE CONSULTANTS

CHICAGO MIDWAY AIRPORT

POrtsmouth 7-6838

4848 W. 63rd. St., Chicago 38, Ill.

Be The First In Your Neighborhood To Have A Swimming Pool A *Country Club* In Your Own Backyard

For as little as **$1595** complete

Call: Lockport 1315M or VI 8-5469 Anytime

We Build Anywhere In Chicago & Suburbs

by *Country Club* Pools

toward the adaptation of known technical principles to the traffic control problem, involves a careful selection from the large storehouse of techniques, as well as research and development on specific methods. The purpose of this phase is twofold: (1) to start the modernization process; and (2) early application of existing technology.

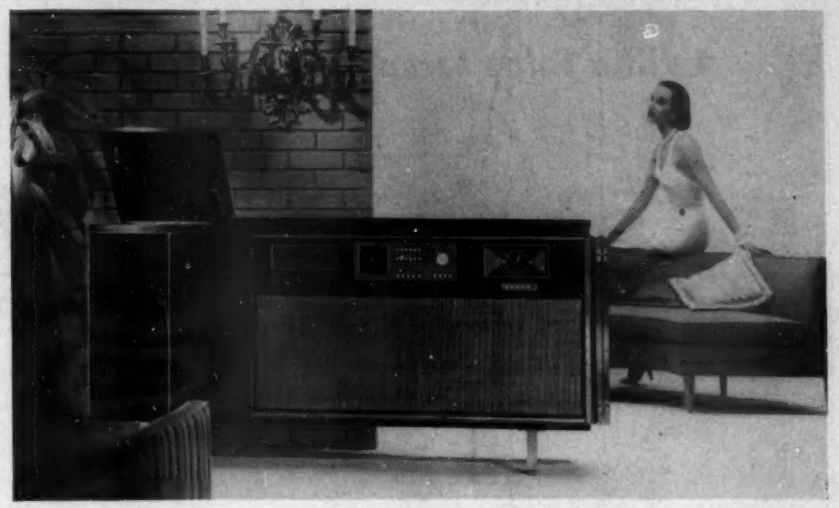
We recommend that this activity be initiated immediately with an interim organization. Specifically, we recommend the following:

1. Operations research.
   a. Continuing the forecasting program initiated by the Office of Aviation Facilities.
   b. Initiating a comprehensive operations analysis program.
   c. Theoretical and gaming analysis.
   d. Airport operations research.
2. System experimentation on significant segments of the system, including:
   a. Multiple and single airport terminal air traffic control.
   b. Airport configuration.
   c. High-density airways.
   d. High-altitude and flexible airways.
   e. Air intercept, attack and return-to-base operations.
   f. Arbitrary area flight.
   g. Exchange of information with SAGE.
3. Carrying out acquisition and modification of appropriate equipment, and experimental development of; for example:
   a. Data processing and display.
   b. Area coverage navigation.
   c. 3-D terminal surveillance radars.
   d. Cooperative surveillance system.
   e. Flexible air traffic control signalling system.
   f. Flow computers.
   g. Airports.
4. Supporting research.
   a. Human engineering-data processing experimentation.
   b. Visual zone-marking techniques.
5. The acquisition of civil and military personnel and personnel on contract to initiate system research as recommended above.
6. Establishment of temporary experimental facilities.

Part III: The third part is the establishment of a continuing capability for modernization of the system.

We recommend the establishment of a permanent mechanism within the government to define the development requirements, promote system development, and introduce timely improvements into current operations.

We recommend finally that immediate action be taken to establish this mechanism because of the lead time required in its establishment and in system development.



You owe yourself Bell & Howell Hi Fi!

It's been a rugged flight . . . but you're home at last. Flip the switch on your Bell & Howell High Fidelity. Let the wonderful world of sound surround you. Relax and be lazy. Listen to music as you like to hear it—and tailor it to your own ear with visual tone control. Write today for free illustrated brochure and name of your nearest dealer. Choose from six smart Paul McCobb designs in five superb finishes. $595 to $1800.

FINER PRODUCTS THROUGH IMAGINATION

Bell & Howell
7159 McCormick Rd., Chicago 45, Ill.

Your Rendezvous At Chicago
Announcing The Opening
Of Private Room Catering
To Banquets And Parties
THE AIRPORT PINES
Across From Midway Airport
4739 W. 55th Street
We Specialize In Sizzling Steaks

Attention All Airline Personnel
Living On Long Island!
TWA Purser George Conway
Can Offer
A 30% Discount
For
Full Screen Combination
Storm Windows
Inquiries Invited.
PYramid 8-0334

ALPA MEMBERS:
write for free catalog
special membership discount
nationwide shipments
GERRY MOBURG & CO.
furniture - carpeting - appliances
2539 w. peterson rd. UPtown 8-7350
CHICAGO, ILL.

T. S. BRIDGES
P. O. Box 10116 Oaks Branch
Fort Worth, Texas
Please place my name on your mailing list to receive information on *Oil Drilling Prospects* for my consideration.
NAME .....
ADDRESS .....
CITY ..... STATE .....

$25,000
(TAX FREE)

Airline Pilot Occupational Disability Group Insurance

We offer our congratulations to the pilots of Northeast Airlines who joined our Airline Pilot Occupational Disability Pool on April 1, 1957.

If you would like to participate in this group plan, ask your local or Master Executive Chairman to contact us.

- Pays a Captain or Co-pilot if permanently prevented from flying for his airline (for physical reasons).
- Pays a Captain for inability to fly as Captain even if he is able to continue flying as Co-pilot.
- Pays a Co-pilot if permanently prevented from being promoted to Captain (for physical reasons) even if able to continue flying as Co-pilot.
- Pays for disability as a result of military reserve flying.
- Pays for disability as a result of Military airlift operations by airlines.
- Pays full $25,000.00, tax free, at end of 12 months.
- Premium collection by payroll deduction.
- "Natural Deterioration" covered unconditionally.

AIRLINES INSURED

BONANZA AIR LINES
CANADIAN PACIFIC AIRLINES
CAPITAL AIRLINES
DELTA AIR LINES (C&S)
EASTERN AIR LINES (COLONIAL)
NORTHEAST AIRLINES
SOUTHERN AIRWAYS
TRANS-CANADA AIR LINES

AVIATION INSURANCE AGENCY, INC.

HARVEY W. WATT, PRES.
(Capt. Eastern Air Lines)

W. M. GRISSOM, VICE-PRES.
(Capt. Delta Air Lines)

ATLANTA AIRPORT ATLANTA, GEORGIA

POplar 7-8656